

Taking the tree seriously: Sievers' Law in Iranian?

44th ECIEC

München
June 21, 2025

0. Roadmap

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1. Introduction

1. Taking the tree seriously:

A phylogenetic / cladistic perspective

First reconstruct all intermediary nodes before proceeding to PIE

Problem: no general agreement about most intermediary nodes
higher than primary branches

Italo-Celtic? Balkan IE? Graeco-Aryan? Indo-Slavic?

More or less secure: Indo-Iranian, Balto-Slavic

⇒ Reconstruct first Proto-Indo-Iranian (PIIr.), then proceed to PIE

1. Introduction

2. Sievers' Law (SL) based on Sievers (1878) ..., cf. Byrd 2010; 2015

*j > *i; *w > *u /XC._V after virtually heavy syllables (X = VR, V:)
syllable boundary morphologically conditioned, hence for suffix-initial *j/w

Not relevant for primarily syllabic *i, distinct from *j
= no converse of SL (as in Germanic)

E.g., “Locative” Suffix *i-(j)o- (Mayrhofer 1986: 161, 165f.) or < *-iHo-
vs. simple *-jo- and *-j-o- (from *i*-stems)

Cf. *k^wtur-íjo-, *diw-ijó-, *ph₂tr-ijo- vs. *méd^h-jo-, *néw-jo-, *sew-jó-, *h₁sṇt-jó-
> Ved. *turíya-*, *div_iyá-*, *pítr_iya-* vs. *mádhyā-*, *návya-*, *savyá-*, *satyá-*

1.2 SL in Indo-Aryan (Early Vedic)

$y > i(y) < y, iy >, w > u(w) < v, uv >$

Ved. *dev-_iyās*, *pārś_uv-á-*, *pátn-_iyā*, *ār_iy-a-*, *rāj-_iyá-*; *mīdh-_uvāms-*, *dās-_uvāms-*

Originally not after obstruent clusters (Schindler 1977)

cf. *mats-ya-*, *-cákṣ-ya*, *tuch-yá-* (*vak-ṣyá-*, *yák-ṣva*, *yuk-ṣvā*, *yuk-tvā*)

would this have included PIE *VHT (> later V:t)?

Extended to (some) -CY° morphs in Vedic (Byrd 2010):

-bhyas ~ *-bh_iyas*, *-dhvam* ~ *-dh_uvam*, *-tva-* ~ *-t_uva-*

but always *-syá-/ṣyá-*, *-tvā*

Lost by late RV due to general *iy*, *uv* > *y*, *v* /C_V (except C = TR)

(but maybe not in all dialects of IA, cf. Pkt. *sūria-*, *āriya-* ~ *sujja-*, *ajja-*)

2. Evidence for SL in Iranian

Problem: Information about syllabicity obscured by

**y*, **w* > OP <iy>, <uv>; Avestan (transmission) <ii>, <uu>

Syllable count in Avestan (Gathic) metrical texts

Early consonantal changes triggered by following **y/w*:

- Common Iranian fricativization **tC* > *θC* etc., cf. **satya-* > **haθya-*
- Dialectal Old Iranian **čy* > *śy* > YAv. *ś*, OP *šy*; cf. **čyawa-* > *śauua-/šiyava-*
YAv. **jy* > **žy* > **ž* > *ž*, cf. **drujya-* > *družā-*
- Old Persian **θy* > *šy*, cf. **haθya-* > *hašiya-*

[Not reliable: Av. post-fricative **w* > *β/b/p*; **hy* > *xii/ñh*, **hw* > *x^v/ñ^vh*]

2.1 Evidence for SL in Avestan

Sievers (1878): Wrong examples = all with old **-i(j)V-*

Schindler (1977: 58f.): 3 relics

- *məṇdāidiiāi* Y 53.6 {mandā-diyāi}
- *mər̥ṇḡduiiē* Y 44.8 {mər̥ng-duwai}
- PN *hūuō.gūua-* 4x 3syll. {haugu.a-} < **hau=gw-a-* from **hugu-*

Beekes (1988: 99f.): “most suffixes have a fixed form”

frequent */-ia-/* might be */-iʔa-/*, hence only 2 examples:

/Haugua-/ < **hau-gv-a-*

fem. *van̥huiiā-* */vahv-iā-/* “must be due to” SL (but */būmyā-/*!):

no, rather */wahu-yā-/* (already Schmidt 1889: 213 n.; metrically supported)

2.1 Evidence for SL in Avestan

1) *məṇdāidiiāi* Y 44.8 = 4 syllables, {məndādiyāi}? vv. ll. *māṇ*°, °*daid*°

Hardly probable against *mərəṇgəidiiāi* {mərng-dyāi} 46.11;

vōizdiiāi {waiz-dyāi} 43.13; *mərqəzdiiāi* {mərñž-dyāi} 44.14;

būždiiāi {būž-dyāi} 44.17; *sūidiiāi* {sū-dyāi} 44.2; 49.3; *sazdiiāi* {saz-dyāi} 30.2;

dazdiiāi {daz-dyāi} 44.1; *āždiiāi* {až-dyāi} 51.17

-ā- not really secure, cf. *māṇcā daidiiāi* Y 31.5, *daidiiāi* Y 51.20

Rather catalectic (or for **mənā. dāidiiāi*, Werba 1986: 335?)

2) *mərəṇgəduiiē* 53.6 {mərng-duwai}?

against *θβarōždūm* {θwarž-dwam} etc.

Probably rather irregular meter (Y 53 generally less regular)

2.1 Evidence for SL in Avestan

3) OAv. *huuō.guua-* (Y 46.16f.; 51.17f.) family name of *frasaōštra-*, *dējāmāspa-* trisyllabic < **hau=gu(w)a-* vs. YAv. *huuōuua-*, *huuōuuī-* < **=γw-a-/ī-* < **hau=gw-a-* derived from *hugu-* (vgl. Ved. *sugú-*), cf. Vedic *náva-gva-* etc.

Unsure: rather **huwa=gw-a-*? (cf. Nyberg 1938; Hoffmann 1974)
metrically (cf. Kümmel 2018) *u n* better than *— u* at all four places

<*huuō*> unexpected from **hau=*, cf. OAv. *haōzqθβa-*; YAv. *haōmanan̥ha-*,
haōsrauuah-, *haōsrauuān̥ha-*, *haōšiiān̥ha-*

Only one dubious parallel: OAv. *huuō.γžaθa-* YH 38.3, if < **hau=gžaθa-*
but better < **hu=wagžaθa-* (Narten 1986: 219ff.; Hintze 2007: 236f.)

°uuō.C normally < **°waC*: *drəguuō.d°* < **drugwad-*, *druuō.gaēθā* < **druwa=g°* ...

2.1 Evidence for/against SL in Avestan

Comparatives

Weak evidence: <jii> (vs. ž), syllable count (?) in YAv.

YAv. *aōjiiēhīš* Yt 13; *nazdiiō* Yt 17.21; *rəṇjiiō* Y 10.19; ⁺*drājiiō* P
but cf. also *yūjiiā-* < **yuǰya-*

Counterexamples stronger:

OAv. *^uruuāⁱdiiā* {*rwādyāh*} 34.6

nāⁱdiiāṇhəm {*nādyāhəm*} 34,8

rāⁱniiō.skər^{ai}tīm {*rānyaskərtīm*} 44.6; 47.3; 50.2

YAv. *tqšiiā*, *tqšiiēhī-* ‘stronger’ < **tanč-yah-* (cf. *taṇcišta-*)

2.1 Evidence against SL in Avestan

No disyllabic variants of endings **-byā*, **-byah*, **-dwai*, **-dwam*

OAv. always *-biiā*, *-biiō*, *-dūm* = {-byā, -byah; -dwam}

-ōibiiō, *-ōibiiā*, *-ō.d^hbiiō*

θβarōždūm {θwarž-dwam}; *sāzdūm* {sāz-dwam}; *-uuōizdūm* {waiz-dwam};

θrāzdūm {θrāz-dwam}; *dazdūm* {daz-dwam}

[Yav. -δβε, -δβəm < **-dwai*, **-dwam*]

Gerundive only *-θβα-* < **-twa-* (vs. Vedic *-tva-* ~ *-t_uva-*)

jaθβα-, *maθβα-*, *scəθβα-*, *vaθβα-/vaθbā-*, *dəstuua-* {dans-twa-}

pōiθβα-, *vōiθβα-*, *staōθβα-*, *xšnaōθβα-*; *yaš^hθβα-*, *vax^hθβα-*

But -TY° not relevant for Byrd's version of SL

2.1 Evidence against SL in Avestan

Perfect participle only {-wāh-}:

OAv. *nq̄suuā* {nans-wāh}; YAv. *yōiθβāh-* < **yayt-wāh-*, *-vaōx^vāh-* < **wawk-wāh-*

Possessive only {-want-}: disyllabic *astuua(ṇ)t-* {astwa(n)t-}, *āfəṇt-* < **āp-want-*

Feminine participle *-qiθiiā-* < **-anθ-yā-* ~ *-aiṇtiiā-* < **-ant-iyā-*

dauuqiθiiā patqiθiiā, bauuqiθiiāica būšiiqiθiiāica, druuqiθiiāt, raxšiiqiθiiā
vs. *vanaiṇtiiāasca, hunuuaiṇtiiā* (cf. *°aiθiiā-* ~ *°aitiiā-*)

Further cases with *y*

mərq̄s̄iiāt {mərns̄-yāt} Y 45.1 < **mərñč-yā-t*

aōj̄iiaēšū {auj̄yaišu} Y 46.12: alleged meaning ‘to be praised’ insecure
patronymic **auj̄y-a-*? (Kellens/Pirart)

2.1 Evidence against SL in Avestan

Further cases with *y*

sar^əi diiaiiā {sard-(i?)yayāh} Y 33.9 ‘companions/rivals’ (?) < **sard-ya-*

qiθiiiā Yt 10.28 < **anθyā-* ‘doorpost’ < **ant-yā-* (cf. Ved. *ātā-*)

pascqiθiia- ‘northern’ < **pasčānθya-* < **pasčā=ant-ya-* (?)

būmiiā {būm-yāh} Y 32.3

uzūiθiiōi {uz=ūθyai} Y 46.5

āfiia- ‘reach’ < **āf-ya-* = Khot. *eh-*, Oss. *af-*

**apāčya-* > **apās(y)a-* > YAv. *apaśa*, Bactrian *abaš* ‘back’, Sogd. *pāš* ‘north’

**frāčya-* > **frās(y)a-* > YAv. *fraśa* ‘forth’, Sogd. *frāš* ‘south’

2.1 Evidence against SL in Avestan

Further cases with *w*

ār^əzuuā {*ārwā*} ‘rightness’ Y 33.1 < **ārw-a-* ← **ərz-u-*

PN *bāṇduua-* {*bandwa-*} Y 49.1f.

rōiθβa-/raēθβa- ‘mix’ < **raiθwa-* < **rait-wa-*

haōzqθβa- < **hau=zanθw-a-* ← **hu=zan-tu-*

vazduuar^ə {*wazd-war*} Y 31.21

yāθβ- ‘sorcerer’ < **yā-tw-* ~ *yā-tu-*

[*dāhuuā* {*dā-hwa*} Y 50.2; *var^əšuuā* {*war-šwa*} Y 53.3

kamna^əfšuuā- {*kamna=fšwā*} 46.2]

2.1 Evidence against SL in Avestan

Disyllabic {i.V}, {u.V} always original

Suffix *-i.(j)o-: {wāstr-i.a-, parw-i.á-, márt-i.a-, napt-i.a-, staum-i.a- ...}
cf. {záw-i.a-, dwit-í.a- ...}

Laryngeal hiatus *i/uHV: {ərž=ǰiH-ai, uz-HiHər-dyāi, haxti-Hāh;
ahu-Hāh, hizuH-ā, tanuH-ah}
cf. {friH-a-, tuH-ám, búH-at, húH-ar, huH-ánh, zuH-áya-, mru(H).-Hai}

Word boundary (= *H?): {pari=(H)augža, pati=
wi=adarsam; hu=(H)apah-, hu=āθra-}

Morphological boundary: {sru.-ai, a-sru.-ātam}

2.2 Further evidence against SL in Iranian

Later stages: no detectable relics of inherited forms with SL

Counterexamples showing non-application at Old Iranian stage

**dauć-ya-* ‘milk’ > MP *dōš-*, Oss. D. *doc-*

**xrauc-ya-* ‘cry, shout’ (YAv. *xraōsiia-*) > **xraušya-* $\Rightarrow$ NP *xurōš-*

**asmāka-* $\rightarrow$ **ahmāč-ya-* > **ahmās(y)a-* ‘our’ > Wanetsi *moš*
beside **ahmāč-iya-ka-* > **amājyaka-* > Khot. *mājaa-*

**snāf-ya-* ‘bathe’ > Khot. *ysānāh-* ($\Rightarrow$ Toch. *sanapa-*, Dragoni 2023)

? **tūr-ya(ka)-* > Av. *tūiriia-* ‘curdled’, MP <tyl(k)> *tīr(ag)* ‘c., solid; turbid; dark’
cf. Av. *tūiri-* ‘curdled (cheese)’; Greek *tūrós*

2.2 Further evidence against SL in Iranian

Counterexamples showing non-application at Old Iranian stage

**tarx-w-* (~ **tark-u-*) ‘turning’ > Pashto *trax* ‘armpit’ (Kreidl 2025: 237ff.)

**parcu-* → **pārcw-a-* ‘Persia, Persian’ > OP *pārsa-*

**parcu-* → **pārcw-a-* ‘side’ (= Ved. *pārś_uvá-*) > **pārswa-* > Oss. *fars*

sraku-/*sraxw-a-* → **srāxw-a-* ‘side’ > Pashto *rox*

?**swa=tāw-ya-* ‘ruler, lord’ > **hwatāwya-* > Bactrian *χoαδηo*, MP *x^wadāy*

[**swai-θya-* ‘own’ > MP *x^wēš*, Oss. D. *xec-*

**swar-ti-* ~ **swar-θy-* ‘food’ > Oss. D. *xwælcæ*

**gā-θw-* (~ **gā-tu-*) → OP *gāθu-* ‘place; throne’, MP *gāh(ūg)*]

2.3 A special case: *TRy

Sequence TRY synchronically impossible

PIE and PIIr. solution: *TR̥Y

cf. Ved. *pitṛvya-*, *bhrātr̥vya-*, *cakṛ̥-vān*, *jaghan-vān*, *jagam-yāt*

but **r̥y* > *riy* in *cakri-yās* etc. (cf. *mri-yá-* = Av. *miriia-* < **mṛ-ya-*)

Av. *tūiriia-*, *brātruiia-/brātūiria-*, *ātriia-* < *(p)*tərwyā-*, **brātərwyā-*, **ātəryā-*

But *TRiy, *TRuw in some cases ~ *TR(i/u)-:

Av. *jaymiiqm*, *baβriiqm*; OP *caxriyā* ‘would have done’;

Av. *jaynuuāh-*; gen. sg. *baršnuuō* < **barznuw-as*

generally **-nuw-V* ~ **-naw-*, **-nu-* (as in Vedic)

Analogical preservation of TR ⇒ only *i(y)*, *u(w)* possible

2.4 Conclusion: SL in Iranian and Indo-Iranian?

No reliable evidence for former existence of SL in Iranian
(except analogical *iy*, *uw* after TR)

Fitting typological profile tolerating more complicated clusters, onsets and codas in Iranian, less preference for “optimal” syllables

Cf. Av. initial /fšt, fsr, fθr, str, xšw, db, tk, (p)t/
internal /fstr, rštr/; final /xš, fš, xšt, st, št, ršt, rt/
mostly inherited (hard to explain as innovations)

What to reconstruct for Proto-Indo-Iranian?

PIIr. otherwise typologically more similar to Iranian than to Sanskrit:
more clusters, no geminates

3. Possible solutions

Solution 1: SL was not PIIr. and hence not PIE,
situation preserved in Iranian (and elsewhere?)

SL = Indo-Aryan innovation (parallel in Germanic)

Fits general IA tendency to optimize syllables incl. onsets
vs. different tendencies in much of Iranian (cf. Kümmel 2014)

Rules for CjV/CiV not very stable diachronically

Cf. Latin *CjV > CiV (> Romance *CjV): **meǵjos* > *me.di.us* > **mɛdjʊ*

Old Persian *CyV > CiyV (against MP)

Germanic *CijV > Gothic CjV, West Germanic *(C)CjV

3. Possible solutions

Solution 2: SL was PIE and PIIr. (more restricted than in Indic/Germanic)

= Loss of variation in Iranian (and other branches)

but with preservation of original/primary $*-i.V-$, how?

a) Syncope in SL-based $*-i(y)V$ vs. primary $*-iXa-$

would presuppose long preservation of $*X = *H$?

Or some equivalent distinction like $*i.yV$ vs. $*i.ØV$ [i?V]?

b) Generalization of shorter variant in SL-cases

How could contrast of nominal $*-ya-$ vs. $*-iya-$ be preserved?

Functionally different enough? Some confusion expected

4. Final conclusions and outlook

No evidence for Sievers' Law in Iranian + preserved contrast $*CyV$: $*CiyV$
 $\Rightarrow$ Conflict with Indic

State at higher node = Proto-Indo-Iranian:

1) Either = Iranian, no SL

SL parallel innovation in Indic, Germanic, and ?

2) Or = Indic, loss of SL in Iranian

only possible if SL-triggered $*i(y)V$ different from primary $*i(X)V$
then what was $*X$?

Only if 2, SL might be PIE (depending on the other nodes)

𐎠𐎡𐎢𐎣𐎤𐎥𐎦𐎧𐎨𐎩𐎪𐎫𐎬𐎭𐎮𐎯𐎰𐎱𐎲𐎳𐎴𐎵𐎶𐎷𐎸𐎹𐎺𐎻𐎼𐎽𐎾𐎿𐏀𐏁𐏂𐏃𐏄𐏅𐏆𐏇𐏈𐏉𐏊𐏋𐏌𐏍𐏎𐏏𐏐𐏑𐏒𐏓𐏔𐏕𐏖𐏗𐏘𐏙𐏚𐏛𐏜𐏝𐏞𐏟𐏠𐏡𐏢𐏣𐏤𐏥𐏦𐏧𐏨𐏩𐏪𐏫𐏬𐏭𐏮𐏯𐏰𐏱𐏲𐏳𐏴𐏵𐏶𐏷𐏸𐏹𐏺𐏻𐏼𐏽𐏾𐏿𐐀𐐁𐐂𐐃𐐄𐐅𐐆𐐇𐐈𐐉𐐊𐐋𐐌𐐍𐐎𐐏𐐐𐐑𐐒𐐓𐐔𐐕𐐖𐐗𐐘𐐙𐐚𐐛𐐜𐐝𐐞𐐟𐐠𐐡𐐢𐐣𐐤𐐥𐐦𐐧𐐨𐐩𐐪𐐫𐐬𐐭𐐮𐐯𐐰𐐱𐐲𐐳𐐴𐐵𐐶𐐷𐐸𐐹𐐺𐐻𐐼𐐽𐐾𐐿𐑀𐑁𐑂𐑃𐑄𐑅𐑆𐑇𐑈𐑉𐑊𐑋𐑌𐑍𐑎𐑏𐑐𐑑𐑒𐑓𐑔𐑕𐑖𐑗𐑘𐑙𐑚𐑛𐑜𐑝𐑞𐑟𐑠𐑡𐑢𐑣𐑤𐑥𐑦𐑧𐑨𐑩𐑪𐑫𐑬𐑭𐑮𐑯𐑰𐑱𐑲𐑳𐑴𐑵𐑶𐑷𐑸𐑹𐑺𐑻𐑼𐑽𐑾𐑿𐒀𐒁𐒂𐒃𐒄𐒅𐒆𐒇𐒈𐒉𐒊𐒋𐒌𐒍𐒎𐒏𐒐𐒑𐒒𐒓𐒔𐒕𐒖𐒗𐒘𐒙𐒚𐒛𐒜𐒝𐒞𐒟𐒠𐒡𐒢𐒣𐒤𐒥𐒦𐒧𐒨𐒩𐒪𐒫𐒬𐒭𐒮𐒯𐒰𐒱𐒲𐒳𐒴𐒵𐒶𐒷𐒸𐒹𐒺𐒻𐒼𐒽𐒾𐒿𐓀𐓁𐓂𐓃𐓄𐓅𐓆𐓇𐓈𐓉𐓊𐓋𐓌𐓍𐓎𐓏𐓐𐓑𐓒𐓓𐓔𐓕𐓖𐓗𐓘𐓙𐓚𐓛𐓜𐓝𐓞𐓟𐓠𐓡𐓢𐓣𐓤𐓥𐓦𐓧𐓨𐓩𐓪𐓫𐓬𐓭𐓮𐓯𐓰𐓱𐓲𐓳𐓴𐓵𐓶𐓷𐓸𐓹𐓺𐓻𐓼𐓽𐓾𐓿𐔀𐔁𐔂𐔃𐔄𐔅𐔆𐔇𐔈𐔉𐔊𐔋𐔌𐔍𐔎𐔏𐔐𐔑𐔒𐔓𐔔𐔕𐔖𐔗𐔘𐔙𐔚𐔛𐔜𐔝𐔞𐔟𐔠𐔡𐔢𐔣𐔤𐔥𐔦𐔧𐔨𐔩𐔪𐔫𐔬𐔭𐔮𐔯𐔰𐔱𐔲𐔳𐔴𐔵𐔶𐔷𐔸𐔹𐔺𐔻𐔼𐔽𐔾𐔿𐕀𐕁𐕂𐕃𐕄𐕅𐕆𐕇𐕈𐕉𐕊𐕋𐕌𐕍𐕎𐕏𐕐𐕑𐕒𐕓𐕔𐕕𐕖𐕗𐕘𐕙𐕚𐕛𐕜𐕝𐕞𐕟𐕠𐕡𐕢𐕣𐕤𐕥𐕦𐕧𐕨𐕩𐕪𐕫𐕬𐕭𐕮𐕯𐕰𐕱𐕲𐕳𐕴𐕵𐕶𐕷𐕸𐕹𐕺𐕻𐕼𐕽𐕾𐕿𐖀𐖁𐖂𐖃𐖄𐖅𐖆𐖇𐖈𐖉𐖊𐖋𐖌𐖍𐖎𐖏𐖐𐖑𐖒𐖓𐖔𐖕𐖖𐖗𐖘𐖙𐖚𐖛𐖜𐖝𐖞𐖟𐖠𐖡𐖢𐖣𐖤𐖥𐖦𐖧𐖨𐖩𐖪𐖫𐖬𐖭𐖮𐖯𐖰𐖱𐖲𐖳𐖴𐖵𐖶𐖷𐖸𐖹𐖺𐖻𐖼𐖽𐖾𐖿𐗀𐗁𐗂𐗃𐗄𐗅𐗆𐗇𐗈𐗉𐗊𐗋𐗌𐗍𐗎𐗏𐗐𐗑𐗒𐗓𐗔𐗕𐗖𐗗𐗘𐗙𐗚𐗛𐗜𐗝𐗞𐗟𐗠𐗡𐗢𐗣𐗤𐗥𐗦𐗧𐗨𐗩𐗪𐗫𐗬𐗭𐗮𐗯𐗰𐗱𐗲𐗳𐗴𐗵𐗶𐗷𐗸𐗹𐗺𐗻𐗼𐗽𐗾𐗿𐘀𐘁𐘂𐘃𐘄𐘅𐘆𐘇𐘈𐘉𐘊𐘋𐘌𐘍𐘎𐘏𐘐𐘑𐘒𐘓𐘔𐘕𐘖𐘗𐘘𐘙𐘚𐘛𐘜𐘝𐘞𐘟𐘠𐘡𐘢𐘣𐘤𐘥𐘦𐘧𐘨𐘩𐘪𐘫𐘬𐘭𐘮𐘯𐘰𐘱𐘲𐘳𐘴𐘵𐘶𐘷𐘸𐘹𐘺𐘻𐘼𐘽𐘾𐘿𐙀𐙁𐙂𐙃𐙄𐙅𐙆𐙇𐙈𐙉𐙊𐙋𐙌𐙍𐙎𐙏𐙐𐙑𐙒𐙓𐙔𐙕𐙖𐙗𐙘𐙙𐙚𐙛𐙜𐙝𐙞𐙟𐙠𐙡𐙢𐙣𐙤𐙥𐙦𐙧𐙨𐙩𐙪𐙫𐙬𐙭𐙮𐙯𐙰𐙱𐙲𐙳𐙴𐙵𐙶𐙷𐙸𐙹𐙺𐙻𐙼𐙽𐙾𐙿𐚀𐚁𐚂𐚃𐚄𐚅𐚆𐚇𐚈𐚉𐚊𐚋𐚌𐚍𐚎𐚏𐚐𐚑𐚒𐚓𐚔𐚕𐚖𐚗𐚘𐚙𐚚𐚛𐚜𐚝𐚞𐚟𐚠𐚡𐚢𐚣𐚤𐚥𐚦𐚧𐚨𐚩𐚪𐚫𐚬𐚭𐚮𐚯𐚰𐚱𐚲𐚳𐚴𐚵𐚶𐚷𐚸𐚹𐚺𐚻𐚼𐚽𐚾𐚿𐛀𐛁𐛂𐛃𐛄𐛅𐛆𐛇𐛈𐛉𐛊𐛋𐛌𐛍𐛎𐛏𐛐𐛑𐛒𐛓𐛔𐛕𐛖𐛗𐛘𐛙𐛚𐛛𐛜𐛝𐛞𐛟𐛠𐛡𐛢𐛣𐛤𐛥𐛦𐛧𐛨𐛩𐛪𐛫𐛬𐛭𐛮𐛯𐛰𐛱𐛲𐛳𐛴𐛵𐛶𐛷𐛸𐛹𐛺𐛻𐛼𐛽𐛾𐛿𐜀𐜁𐜂𐜃𐜄𐜅𐜆𐜇𐜈𐜉𐜊𐜋𐜌𐜍𐜎𐜏𐜐𐜑𐜒𐜓𐜔𐜕𐜖𐜗𐜘𐜙𐜚𐜛𐜜𐜝𐜞𐜟𐜠𐜡𐜢𐜣𐜤𐜥𐜦𐜧𐜨𐜩𐜪𐜫𐜬𐜭𐜮𐜯𐜰𐜱𐜲𐜳𐜴𐜵𐜶𐜷𐜸𐜹𐜺𐜻𐜼𐜽𐜾𐜿𐝀𐝁𐝂𐝃𐝄𐝅𐝆𐝇𐝈𐝉𐝊𐝋𐝌𐝍𐝎𐝏𐝐𐝑𐝒𐝓𐝔𐝕𐝖𐝗𐝘𐝙𐝚𐝛𐝜𐝝𐝞𐝟𐝠𐝡𐝢𐝣𐝤𐝥𐝦𐝧𐝨𐝩𐝪𐝫𐝬𐝭𐝮𐝯𐝰𐝱𐝲𐝳𐝴𐝵𐝶𐝷𐝸𐝹𐝺𐝻𐝼𐝽𐝾𐝿𐞀𐞁𐞂𐞃𐞄𐞅𐞆𐞇𐞈𐞉𐞊𐞋𐞌𐞍𐞎𐞏𐞐𐞑𐞒𐞓𐞔𐞕𐞖𐞗𐞘𐞙𐞚𐞛𐞜𐞝𐞞𐞟𐞠𐞡𐞢𐞣𐞤𐞥𐞦𐞧𐞨𐞩𐞪𐞫𐞬𐞭𐞮𐞯𐞰𐞱𐞲𐞳𐞴𐞵𐞶𐞷𐞸𐞹𐞺𐞻𐞼𐞽𐞾𐞿𐟀𐟁𐟂𐟃𐟄𐟅𐟆𐟇𐟈𐟉𐟊𐟋𐟌𐟍𐟎𐟏𐟐𐟑𐟒𐟓𐟔𐟕𐟖𐟗𐟘𐟙𐟚𐟛𐟜𐟝𐟞𐟟𐟠𐟡𐟢𐟣𐟤𐟥𐟦𐟧𐟨𐟩𐟪𐟫𐟬𐟭𐟮𐟯𐟰𐟱𐟲𐟳𐟴𐟵𐟶𐟷𐟸𐟹𐟺𐟻𐟼𐟽𐟾𐟿𐠀𐠁𐠂𐠃𐠄𐠅𐠆𐠇𐠈𐠉𐠊𐠋𐠌𐠍𐠎𐠏𐠐𐠑𐠒𐠓𐠔𐠕𐠖𐠗𐠘𐠙𐠚𐠛𐠜𐠝𐠞𐠟𐠠𐠡𐠢𐠣𐠤𐠥𐠦𐠧𐠨𐠩𐠪𐠫𐠬𐠭𐠮𐠯𐠰𐠱𐠲𐠳𐠴𐠵𐠶𐠷𐠸𐠹𐠺𐠻𐠼𐠽𐠾𐠿𐡀𐡁𐡂𐡃𐡄𐡅𐡆𐡇𐡈𐡉𐡊𐡋𐡌𐡍𐡎𐡏𐡐𐡑𐡒𐡓𐡔𐡕𐡖𐡗𐡘𐡙𐡚𐡛𐡜𐡝𐡞𐡟𐡠𐡡𐡢𐡣𐡤𐡥𐡦𐡧𐡨𐡩𐡪𐡫𐡬𐡭𐡮𐡯𐡰𐡱𐡲𐡳𐡴𐡵𐡶𐡷𐡸𐡹𐡺𐡻𐡼𐡽𐡾𐡿𐢀𐢁𐢂𐢃𐢄𐢅𐢆𐢇𐢈𐢉𐢊𐢋𐢌𐢍𐢎𐢏𐢐𐢑𐢒𐢓𐢔𐢕𐢖𐢗𐢘𐢙𐢚𐢛𐢜𐢝𐢞𐢟𐢠𐢡𐢢𐢣𐢤𐢥𐢦𐢧𐢨𐢩𐢪𐢫𐢬𐢭𐢮𐢯𐢰𐢱𐢲𐢳𐢴𐢵𐢶𐢷𐢸𐢹𐢺𐢻𐢼𐢽𐢾𐢿𐣀𐣁𐣂𐣃𐣄𐣅𐣆𐣇𐣈𐣉𐣊𐣋𐣌𐣍𐣎𐣏𐣐𐣑𐣒𐣓𐣔𐣕𐣖𐣗𐣘𐣙𐣚𐣛𐣜𐣝𐣞𐣟𐣠𐣡𐣢𐣣𐣤𐣥𐣦𐣧𐣨𐣩𐣪𐣫𐣬𐣭𐣮𐣯𐣰𐣱𐣲𐣳𐣴𐣵𐣶𐣷𐣸𐣹𐣺𐣻𐣼𐣽𐣾𐣿𐤀𐤁𐤂𐤃𐤄𐤅𐤆𐤇𐤈𐤉𐤊𐤋𐤌𐤍𐤎𐤏𐤐𐤑𐤒𐤓𐤔𐤕𐤖𐤗𐤘𐤙𐤚𐤛𐤜𐤝𐤞𐤟𐤠𐤡𐤢𐤣𐤤𐤥𐤦𐤧𐤨𐤩𐤪𐤫𐤬𐤭𐤮𐤯𐤰𐤱𐤲𐤳𐤴𐤵𐤶𐤷𐤸𐤹𐤺𐤻𐤼𐤽𐤾𐤿𐥀𐥁𐥂𐥃𐥄𐥅𐥆𐥇𐥈𐥉𐥊𐥋𐥌𐥍𐥎𐥏𐥐𐥑𐥒𐥓𐥔𐥕𐥖𐥗𐥘𐥙𐥚𐥛𐥜𐥝𐥞𐥟𐥠𐥡𐥢𐥣𐥤𐥥𐥦𐥧𐥨𐥩𐥪𐥫𐥬𐥭𐥮𐥯𐥰𐥱𐥲𐥳𐥴𐥵𐥶𐥷𐥸𐥹𐥺𐥻𐥼𐥽𐥾𐥿𐦀𐦁𐦂𐦃𐦄𐦅𐦆𐦇𐦈𐦉𐦊𐦋𐦌𐦍𐦎𐦏𐦐𐦑𐦒𐦓𐦔𐦕𐦖𐦗𐦘𐦙𐦚𐦛𐦜𐦝𐦞𐦟𐦠𐦡𐦢𐦣𐦤𐦥𐦦𐦧𐦨𐦩𐦪𐦫𐦬𐦭𐦮𐦯𐦰𐦱𐦲𐦳𐦴𐦵𐦶𐦷𐦸𐦹𐦺𐦻𐦼𐦽𐦾𐦿𐧀𐧁𐧂𐧃𐧄𐧅𐧆𐧇𐧈𐧉𐧊𐧋𐧌𐧍𐧎𐧏𐧐𐧑𐧒𐧓𐧔𐧕𐧖𐧗𐧘𐧙𐧚𐧛𐧜𐧝𐧞𐧟𐧠𐧡𐧢𐧣𐧤𐧥𐧦𐧧𐧨𐧩𐧪𐧫𐧬𐧭𐧮𐧯𐧰𐧱𐧲𐧳𐧴𐧵𐧶𐧷𐧸𐧹𐧺𐧻𐧼𐧽𐧾𐧿𐨀𐨁𐨂𐨃𐨄𐨅𐨆𐨇𐨈𐨉𐨊𐨋𐨌𐨍𐨎𐨏𐨐𐨑𐨒𐨓𐨔𐨕𐨖𐨗𐨘𐨙𐨚𐨛𐨜𐨝𐨞𐨟𐨠𐨡𐨢𐨣𐨤𐨥𐨦𐨧𐨨𐨩𐨪𐨫𐨬𐨭𐨮𐨯𐨰𐨱𐨲𐨳𐨴𐨵𐨶𐨷𐨹𐨺𐨸𐨻𐨼𐨽𐨾𐨿𐩀𐩁𐩂𐩃𐩄𐩅𐩆𐩇𐩈𐩉𐩊𐩋𐩌𐩍𐩎𐩏𐩐𐩑𐩒𐩓𐩔𐩕𐩖𐩗𐩘𐩙𐩚𐩛𐩜𐩝𐩞𐩟𐩠𐩡𐩢𐩣𐩤𐩥𐩦𐩧𐩨𐩩𐩪𐩫𐩬𐩭𐩮𐩯𐩰𐩱𐩲𐩳𐩴𐩵𐩶𐩷𐩸𐩹𐩺𐩻𐩼𐩽𐩾𐩿𐪀𐪁𐪂𐪃𐪄𐪅𐪆𐪇𐪈𐪉𐪊𐪋𐪌𐪍𐪎𐪏𐪐𐪑𐪒𐪓𐪔𐪕𐪖𐪗𐪘𐪙𐪚𐪛𐪜𐪝𐪞𐪟𐪠𐪡𐪢𐪣𐪤𐪥𐪦𐪧𐪨𐪩𐪪𐪫𐪬𐪭𐪮𐪯𐪰𐪱𐪲𐪳𐪴𐪵𐪶𐪷𐪸𐪹𐪺𐪻𐪼𐪽𐪾𐪿𐫀𐫁𐫂𐫃𐫄𐫅𐫆𐫇𐫈𐫉𐫊𐫋𐫌𐫍𐫎𐫏𐫐𐫑𐫒𐫓𐫔𐫕𐫖𐫗𐫘𐫙𐫚𐫛𐫜𐫝𐫞𐫟𐫠𐫡𐫢𐫣𐫤𐫦𐫥𐫧𐫨𐫩𐫪𐫫𐫬𐫭𐫮𐫯𐫰𐫱𐫲𐫳𐫴𐫵𐫶𐫷𐫸𐫹𐫺𐫻𐫼𐫽𐫾𐫿𐬀𐬁𐬂𐬃𐬄𐬅𐬆𐬇𐬈𐬉𐬊𐬋𐬌𐬍𐬎𐬏𐬐𐬑𐬒𐬓𐬔𐬕𐬖𐬗𐬘𐬙𐬚𐬛𐬜𐬝𐬞𐬟𐬠𐬡𐬢𐬣𐬤𐬥𐬦𐬧𐬨𐬩𐬪𐬫𐬬𐬭𐬮𐬯𐬰𐬱𐬲𐬳𐬴𐬵𐬶𐬷𐬸𐬹𐬺𐬻𐬼𐬽𐬾𐬿𐭀𐭁𐭂𐭃𐭄𐭅𐭆𐭇𐭈𐭉𐭊𐭋𐭌𐭍𐭎𐭏𐭐𐭑𐭒𐭓𐭔𐭕𐭖𐭗𐭘𐭙𐭚𐭛𐭜𐭝𐭞𐭟𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿𐮀𐮁𐮂𐮃𐮄𐮅𐮆𐮇𐮈𐮉𐮊𐮋𐮌𐮍𐮎𐮏𐮐𐮑𐮒𐮓𐮔𐮕𐮖𐮗𐮘𐮙𐮚𐮛𐮜𐮝𐮞𐮟𐮠𐮡𐮢𐮣𐮤𐮥𐮦𐮧𐮨𐮩𐮪𐮫𐮬𐮭𐮮𐮯𐮰𐮱𐮲𐮳𐮴𐮵𐮶𐮷𐮸𐮹𐮺𐮻𐮼𐮽𐮾𐮿𐯀𐯁𐯂𐯃𐯄𐯅𐯆𐯇𐯈𐯉𐯊𐯋𐯌𐯍𐯎𐯏𐯐𐯑𐯒𐯓𐯔𐯕𐯖𐯗𐯘𐯙𐯚𐯛𐯜𐯝𐯞𐯟𐯠𐯡𐯢𐯣𐯤𐯥𐯦𐯧𐯨𐯩𐯪𐯫𐯬𐯭𐯮𐯯𐯰𐯱𐯲𐯳𐯴𐯵𐯶𐯷𐯸𐯹𐯺𐯻𐯼𐯽𐯾𐯿𐰀𐰁𐰂𐰃𐰄𐰅𐰆𐰇𐰈𐰉𐰊𐰋𐰌𐰍𐰎𐰏𐰐𐰑𐰒𐰓𐰔𐰕𐰖𐰗𐰘𐰙𐰚𐰛𐰜𐰝𐰞𐰟𐰠𐰡𐰢𐰣𐰤𐰥𐰦𐰧𐰨𐰩𐰪𐰫𐰬𐰭𐰮𐰯𐰰𐰱𐰲𐰳𐰴𐰵𐰶𐰷𐰸𐰹𐰺𐰻𐰼𐰽𐰾𐰿𐱀𐱁𐱂𐱃𐱄𐱅𐱆𐱇𐱈𐱉𐱊𐱋𐱌𐱍𐱎𐱏𐱐𐱑𐱒𐱓𐱔𐱕𐱖𐱗𐱘𐱙𐱚𐱛𐱜𐱝𐱞𐱟𐱠𐱡𐱢𐱣𐱤𐱥𐱦𐱧𐱨𐱩𐱪𐱫𐱬𐱭𐱮𐱯𐱰𐱱𐱲𐱳𐱴𐱵𐱶𐱷𐱸𐱹𐱺𐱻𐱼𐱽𐱾𐱿𐲀𐲁𐲂𐲃𐲄𐲅𐲆𐲇𐲈𐲉𐲊𐲋𐲌𐲍𐲎𐲏𐲐𐲑𐲒𐲓𐲔𐲕𐲖𐲗𐲘𐲙𐲚𐲛𐲜𐲝𐲞𐲟𐲠𐲡𐲢𐲣𐲤𐲥𐲦𐲧𐲨𐲩𐲪𐲫𐲬𐲭𐲮𐲯𐲰𐲱𐲲𐲳𐲴𐲵𐲶𐲷𐲸𐲹𐲺𐲻𐲼𐲽𐲾𐲿𐳀𐳁𐳂𐳃𐳄𐳅𐳆𐳇𐳈𐳉𐳊𐳋𐳌𐳍𐳎𐳏𐳐𐳑𐳒𐳓𐳔𐳕𐳖𐳗𐳘𐳙𐳚𐳛𐳜𐳝𐳞𐳟𐳠𐳡𐳢𐳣𐳤𐳥𐳦𐳧𐳨𐳩𐳪𐳫𐳬𐳭𐳮𐳯𐳰𐳱𐳲𐳳𐳴𐳵𐳶𐳷𐳸𐳹𐳺𐳻𐳼𐳽𐳾𐳿𐴀𐴁𐴂𐴃𐴄𐴅𐴆𐴇𐴈𐴉𐴊𐴋𐴌𐴍𐴎𐴏𐴐𐴑𐴒𐴓𐴔𐴕𐴖𐴗𐴘𐴙𐴚𐴛𐴜𐴝𐴞𐴟𐴠𐴡𐴢𐴣𐴤𐴥𐴦𐴧𐴨𐴩𐴪𐴫𐴬𐴭𐴮𐴯𐴰𐴱𐴲𐴳𐴴𐴵𐴶𐴷𐴸𐴹𐴺𐴻𐴼𐴽𐴾𐴿𐵀𐵁𐵂𐵃𐵄𐵅𐵆𐵇𐵈𐵉𐵊𐵋𐵌𐵍𐵎𐵏𐵐𐵑𐵒𐵓𐵔𐵕𐵖𐵗𐵘𐵙𐵚𐵛𐵜𐵝𐵞𐵟𐵠𐵡𐵢𐵣𐵤𐵥𐵦𐵧𐵨𐵩𐵪𐵫𐵬𐵭𐵮𐵯𐵰𐵱𐵲𐵳𐵴𐵵𐵶𐵷𐵸𐵹𐵺𐵻𐵼𐵽𐵾𐵿𐶀𐶁𐶂𐶃𐶄𐶅𐶆𐶇𐶈𐶉𐶊𐶋𐶌𐶍𐶎𐶏𐶐𐶑𐶒𐶓𐶔𐶕𐶖𐶗𐶘𐶙𐶚𐶛𐶜𐶝𐶞𐶟𐶠𐶡𐶢𐶣𐶤𐶥𐶦𐶧𐶨𐶩𐶪𐶫𐶬𐶭𐶮𐶯𐶰𐶱𐶲𐶳𐶴𐶵𐶶𐶷𐶸𐶹𐶺𐶻𐶼𐶽𐶾𐶿𐷀𐷁𐷂𐷃𐷄𐷅𐷆𐷇𐷈𐷉𐷊𐷋𐷌𐷍𐷎𐷏𐷐𐷑𐷒𐷓𐷔𐷕𐷖𐷗𐷘𐷙𐷚𐷛𐷜𐷝𐷞𐷟𐷠𐷡𐷢𐷣𐷤𐷥𐷦𐷧𐷨𐷩𐷪𐷫𐷬𐷭𐷮𐷯𐷰𐷱𐷲𐷳𐷴𐷵𐷶𐷷𐷸𐷹𐷺𐷻𐷼𐷽𐷾𐷿𐸀𐸁𐸂𐸃𐸄𐸅𐸆𐸇𐸈𐸉𐸊𐸋𐸌𐸍𐸎𐸏𐸐𐸑𐸒𐸓𐸔𐸕𐸖𐸗𐸘𐸙𐸚𐸛𐸜𐸝𐸞𐸟𐸠𐸡𐸢𐸣𐸤𐸥𐸦𐸧𐸨𐸩𐸪𐸫𐸬𐸭𐸮𐸯𐸰𐸱𐸲𐸳𐸴𐸵𐸶𐸷𐸸𐸹𐸺𐸻𐸼𐸽𐸾𐸿𐹀𐹁𐹂𐹃𐹄𐹅𐹆𐹇𐹈𐹉𐹊𐹋𐹌𐹍𐹎𐹏𐹐𐹑𐹒𐹓𐹔𐹕𐹖𐹗𐹘𐹙𐹚𐹛𐹜𐹝𐹞𐹟𐹠𐹡𐹢𐹣𐹤𐹥𐹦𐹧𐹨𐹩𐹪𐹫𐹬𐹭𐹮𐹯𐹰𐹱𐹲𐹳𐹴𐹵𐹶𐹷𐹸𐹹𐹺𐹻𐹼𐹽𐹾𐹿𐺀𐺁𐺂𐺃𐺄𐺅𐺆𐺇𐺈𐺉𐺊𐺋𐺌𐺍𐺎𐺏𐺐𐺑𐺒𐺓𐺔𐺕𐺖𐺗𐺘𐺙𐺚𐺛𐺜𐺝𐺞𐺟𐺠𐺡𐺢𐺣𐺤𐺥𐺦𐺧𐺨𐺩𐺪𐺫𐺬𐺭𐺮𐺯𐺰𐺱𐺲𐺳𐺴𐺵𐺶𐺷𐺸𐺹𐺺𐺻𐺼𐺽𐺾𐺿𐻀𐻁𐻂𐻃𐻄𐻅𐻆𐻇𐻈𐻉𐻊𐻋𐻌𐻍𐻎𐻏𐻐𐻑𐻒𐻓𐻔𐻕𐻖𐻗𐻘𐻙𐻚𐻛𐻜𐻝𐻞𐻟𐻠𐻡𐻢𐻣𐻤𐻥𐻦𐻧𐻨𐻩𐻪𐻫𐻬𐻭𐻮𐻯𐻰𐻱𐻲𐻳𐻴𐻵𐻶𐻷𐻸𐻹𐻺𐻻𐻼𐻽𐻾𐻿𐼀𐼁𐼂𐼃𐼄𐼅𐼆𐼇𐼈𐼉𐼊𐼋𐼌𐼍𐼎𐼏𐼐𐼑𐼒𐼓𐼔𐼕𐼖𐼗𐼘𐼙𐼚𐼛𐼜𐼝𐼞𐼟𐼠𐼡𐼢𐼣𐼤𐼥𐼦𐼧𐼨𐼩𐼪𐼫𐼬𐼭𐼮𐼯𐼰𐼱𐼲𐼳𐼴𐼵𐼶𐼷𐼸𐼹𐼺𐼻𐼼𐼽𐼾𐼿𐽀𐽁𐽂𐽃𐽄𐽅𐽆𐽇𐽋𐽍𐽎𐽏𐽐𐽈𐽉𐽊𐽌𐽑𐽒𐽓𐽔𐽕𐽖𐽗𐽘𐽙𐽚𐽛𐽜𐽝𐽞𐽟𐽠𐽡𐽢𐽣𐽤𐽥𐽦𐽧𐽨𐽩𐽪𐽫𐽬𐽭𐽮𐽯𐽰𐽱𐽲𐽳𐽴𐽵𐽶𐽷𐽸𐽹𐽺𐽻𐽼𐽽𐽾𐽿𐾀𐾁𐾃𐾅𐾂𐾄𐾆𐾇𐾈𐾉𐾊𐾋𐾌𐾍𐾎𐾏𐾐𐾑𐾒𐾓𐾔𐾕𐾖𐾗𐾘𐾙𐾚𐾛𐾜𐾝𐾞𐾟𐾠𐾡𐾢𐾣𐾤𐾥𐾦𐾧𐾨𐾩𐾪𐾫𐾬𐾭𐾮𐾯𐾰